The Citrus Industry

Shirley Rhodes, who has reigned over the citrus industry this year. Her successor will be selected on the opening night of the Florida Citrus Exposition which opens in Winter Haven February 14th.

Vol. 30, No. 2 February, 1949

The Tree Doesn't Know What the Market Is . . .

The tree doesn't know what the market is. It is a living organism, which, according to the laws of nature and the care of man, goes about its natural job of producing citrus fruit.

The tree's owner must solve his own economic problems. On the one hand he must balance what he can get at the market against what care he can afford to give the tree.

Part of the grower's dilemma comes from the fact that the care his trees get this year is reflected in the quality of the fruit he gets NEXT year and the year after that. There are certain operations that can be reduced without materially affecting the tree's condition this season or the next. But trees must be sprayed. Otherwise, in the years to come, even when markets are strong, for lack of investment today, the grower must suffer at the market tomorrow.

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JACKSONVILLE, FLORIDA

Florida's 25th Citrus Exposition

Dates for the 25th Anniversary Florida Citrus Exposition have been set at February 14-19, according to an announcement made by John A. Snively, Jr., Exposition president. Special decorations throughout the grounds and buildings will be used to highlight the observance of the show's twenty-five years of service to the Florida citrus industry and the state, Snively said.

General Manager Philip E. Lucey states that the Exposition will have the greatest variety of citrus exhibits since the show has been in existence. These exhibits, from every section of the citrus belt, will carry out the Exposition's Silver Anniversary theme. Every inch of available space has already been booked by manufacturers and representatives of farm and grove machinery and equipment, Lucey said.

The Exposition will be opened with a giant parade of school bands, lavish floats, military units and marching groups which will take place Monday morning. When the parade enters the Exposition grounds promptly at ten o'clock a formation of U. S. Air Corps planes will swoop over in salute. Charles Race, parade chairman, has announced that this parade will be bigger and better than any ever held in the past.

Citrusmen from all over Florida will congregate for the annual Fruitman's Dinner which will be held as usual at the Winter Haven Armory. The same grand barbecue and entertainment will be offered to the hundreds who will attend this yearly get together of growers, shippers, packers and processors of citrus.

The Press Breakfast, for members of Florida's Fourth Estate, will be held at midnight on Friday. This hilarious event gives newsmen of the state an opportunity to good-naturedly rib the great and near great to their heart's content. Luncheons for Governor Warren and Commissioner of Agriculture Nathan Mayo will be given by officials of the Exposition, and the Winter Haven Merchants Association will again sponsor an orange picking contest and a packing contest.

The Queen of the Exposition and the Citrus Industry will be chosen from

(Continued On Page 22)

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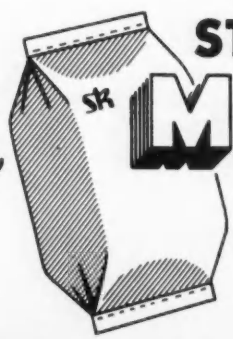

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A Preliminary Report On The Possibilities For Forecasting Periods Of Oviposition Activity For Purple and Florida Red Scales . . .

J. T. Griffiths, Jr. and W. L. Thompson
At Meeting Florida State Horticultural Society

During the past thirty years, it has often been suggested (1, 2, 3) that the optimum time for the application of oil sprays for scale insect control on citrus coincided with that period in the life cycle of the scales when there was a maximum of young scales and a minimum of old ones. This period represented a time immediately following egg production and subsequent scale crawler activity. Watson (4) stated that there were three times when purple scale crawlers were most numerous. These periods were usually around April 15, July 1, and September 1. However, no such figures have been quoted for Florida red scales. The data presented in this report were accumulated between September 1946 and October 1948, and show that both purple and Florida red scales follow regular reproductive cycles. Leaf samples for scale counts were collected in the central part of the state from as far south as Lake Placid and as far north as Weirsdale, and from Vero Beach and Cocoa on the east coast. Some discrepancies are present, but the fact that the data average out and coincide to present statewide similarity is all the more remarkable when it is considered that these data were usually obtained in the process of other scale insect studies, and were therefore not always taken in an orderly fashion.

Scale counts were made from leaves picked at random from one or more trees in a grove. Scales identified as males were not counted, but all female scales and those young ones unidentifiable as males were recorded as to whether they were in first stage (a newly settled scale prior to first molt), second stage (a scale between first and second molts), or third stage. The inclusion of unidentifiable males results in excessive numbers of scales in first and early second stages but the data are still readily interpretable. The female scales in third stage were further subdivided into those which were immature or not yet laying eggs and those which were mature and were laying eggs. From these counts a per cent figure for each stage was computed. The percentages were then arranged chronologically and averaged for a given period of time (usually less than two weeks). The averages were made without regard to geographical location and are presented for purple scales in Table 1 and for Florida red scales in Table 2. The number of groves sampled for each average is also shown. Scale counts were usually made on mature foliage and thus young leaves were avoided when samples were taken. Because of the pronounced flush of growth in the spring of the year, counts were made on old foliage up to a certain date and then from that time on, spring flush growth was selected for scale counting. This change is indicated in the tables and also in the graphs which appear below.

Both purple scale and Florida red scale show similar changes in the per cent of scales in any given stage as a function of time. In order to explain these changes, the counts of purple scales made in one grove near Lake Alfred are shown for a period of 58 days in Fig. 1. On May 26, 1948, 45 per cent of the scales were in second stage, 29 per cent in first stage, and 13 per cent in both immature and mature third stage. By June 1 the number of second stage scales had increased and all others had decreased. Then, as the per cent of second stages decreased, the number of immature third stages increased. This would be expected, as the scales in second

stage were then becoming third stage scales. The increase in immature third stages was followed closely by an increase in egg laying females. By June 23, most of the scale population was in third stage. At this time, many eggs were being laid and a period of crawler activity was beginning. Consequently, the number of first stage scales began to increase. On July 23 a majority of the population was in first stage. The reason for the upswing of second stage scales between June 23 and July 8 is not understood at the present time. It may be typical of the expected changes or it may be due to an error in sampling technique. In any case, the general trends appear to be regular and a definite sequence is demonstrable. Data on Florida red scales show that similar changes take place, but that the life cycle is shorter than for purple scales.

In order to simplify the graphic presentation of the data in Tables 1 and 2, the per cent of scales in first and second stage is combined and only this figure is shown for purple scales in Fig. 2 and for Florida red scales in Fig. 3. In some instances no counts were made during critical periods, and estimated changes are shown by means of broken lines. It is believed by the authors that these estimates are accurate and that they represent actual populations changes. The peaks in Figs. 2 and 3 are dated and represent periods when most of the scale population was in first and second stage. As would be expected, these periods followed times of maximum oviposition. If the per cent of scales in mature third were also plotted on these graphs, it would be found that maximum oviposition periods coincide with a minimum of scales in first and second stage. As would be expected, these periods followed times of maximum oviposition. If the per cent of scales in mature third were also plotted on these graphs, it would be found that maximum oviposition periods coincide with a minimum of scales in first and second stage and that they precede the increases in first and second stages shown in the graphs.

The graphs demonstrate that there were definite and relatively regular cycles for both species of scales, and strongly suggest the possibility that such population changes could be anticipated several weeks in advance. In both 1947 and 1948, the initial oviposition periods for both species of scale coincided with the approximate time of the onset of bloom. Similar observations have been made by the authors in previous years. Although the exact reasons for this phenomenon are not fully understood, it appears that winter temperatures may produce a leavening effect such that the scales grow very slowly, lay a minimum of eggs, and the few eggs that are laid hatch only after long intervals. Thus, the winter ends with the bulk of the scale population either laying eggs or about to lay eggs, but with little hatch occurring. Apparently the weather cycle which causes a tree to grow and bloom in the spring also causes the infesting scale population to grow and to increase the rate of oviposition. As a result, periods

Table I.
Per Cent of Purple Scales in Different Stages from September 1946 to October 1948

	Date	Number of Locations	Per Cent Scales in Each Stage			
			1st	2nd	Immature 3rd	Mature 3rd
1946	September 23	1	37	32	13	18
	October 20	2	33	7	26	33
	November 13	1	31	8	32	27
	December 9	1	25	21	29	24
1947	January 8	2	50	20	13	17
	February 19	3	10	24	51	15
	March 26	3	10	23	52	15
	May 4	3	28	21	25	26
	May 5	2	81	19	0	0
	May 20	2	38	36	16	1
	June 3	1	38	38	21	3
	June 17	3	44	21	21	14
	June 30	2	61	23	3	14
	July 11	2	71	26	1	3
	July 24	2	25	45	23	8
	August 4	3	50	18	13	19
	August 21	3	24	29	15	32
	September 3	3	60	17	10	13
	September 9	2	53	32	5	10
	October 14	1	49	27	8	16
	November 11	3	29	32	16	23
	December 22	6	19	29	22	29
1948	January 8	5	24	35	18	23
	January 27	4	20	30	26	24
	February 5	7	25	30	17	28
	February 13	4	17	37	22	25
	February 28	5	17	38	20	25
	March 11	7	27	40	19	12
	March 19	3	97	4	0	0
	April 17	6	34	45	18	5
	April 27	4	20	64	15	1
	May 4	2	17	35	40	7
	May 22	6	24	40	15	21
	June 6	6	20	43	21	17
	June 16	11	16	31	33	21
	June 27	3	17	28	32	23
	July 6	3	19	34	35	12
	July 20	2	45	26	12	17
	July 30	2	32	36	17	16
	August 11	4	43	27	17	11
	August 20	5	26	29	29	15
	September 2	9	34	22	21	23
	September 14	3	22	32	26	20
	September 27	8	25	35	14	26

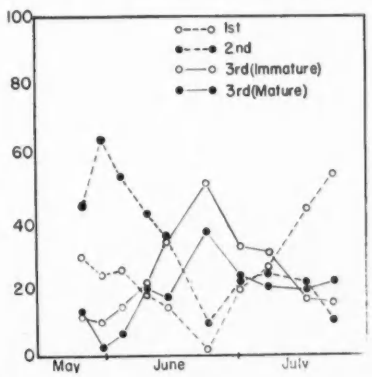
of bloom and spring oviposition of the scales tend to coincide.

Following the spring oviposition period in 1947, there were only two more pronounced oviposition periods for purple scales. One was about July 1 and the other about September 1. Thus, 1947 corresponds to the periods noted by Watson (4), and 1947 was a year with a relatively normal blooming date. In the case of red scales, there were three additional oviposition periods, which is one more than for purple scale. For both species of scales, there was a slight increase of young scales in late January 1948. It is possible that this period was comparable to the pronounced oviposition period shown during the warm period in early January of 1947, but that the 1948 period was an abortive one due to the cool weather which occurred in that year.

The 1948 growing season was characterized by an early flush of spring foliage, an early bloom, and

Figure I

Per Cent of Purple Scales in Each Stage



also an early time for scale crawlers to appear in large numbers. Post-bloom sprays were applied in some areas prior to March 15. This was a month earlier than in 1947 and is quite comparable to the spring of 1946 when crawler periods occurred in late March. As a result of the early spring in 1948, the second generation of both red and purple scales occurred in late May and early June, respectively, and by October both species had produced one more generation than in 1947. This represents a similar situation to that which occurred in 1946. Thus, it may be expected that the generally heavy scale infestations which started with an extra generation in 1946 due to an early spring and late fall, and which have continued through 1948 and 1948, may well continue into 1949.

One abnormal fluctuation of red scale in Fig. 3 can be explained. According to the graph, it appears that in February, 1947 there was a response to an oviposition period. The rise in the per cent of scales in first and second stages was actually caused by another set of circumstances. The severe freeze which occurred in early February, 1947, resulted in the elimination of practically all first stage and mature third stage scales. This left the majority of the scales in second stage, which shows as an increase in young scales on the graph.

(Continued on page 20)

Table II.
Per Cent of Florida Red Scales in Different Stages
From September 1946 to October 1947

	Date	Number of Locations	Per Cent Scales in Each Stage			
			1st	2nd	Immature 3rd	Mature 3rd
1946	September 19	8	35	34	26	5
	October 10	4	54	14	9	23
	October 22	5	64	24	8	4
	November 1	4	37	37	16	10
	November 19	5	35	31	30	4
	December 11	7	33	31	30	5
	December 25	4	36	19	26	18
1947	January 8	8	56	26	12	5
	January 20	4	42	26	25	7
	February 5	6	21	37	33	8
	February 25	11	16	50	32	2
	March 6	11	13	47	37	2
	March 21	5	1	42	55	2
	April 8	4	0	13	85	2
	April 22	5	29	3	46	22
	April 30	3	32	28	22	18
	May 8	2	42	40	10	8
	May 16	2	23	38	27	10
	May 24	5	13	60	24	2
	June 5	2	32	32	36	0
	June 18	4	46	18	23	13
	June 27	6	63	33	3	1
	July 10	4	63	27	8	3
	July 17	5	36	37	25	2
	August 4	6	25	36	34	4
	August 17	5	42	34	18	6
	October 1	2	58	13	23	6
	October 19	3	54	41	3	2
	November 20	5	55	38	8	1
	December 23	3	12	50	26	12
1948	January 20	9	39	32	23	4
	January 28	1	5	40	50	5
	February 23	1	14	14	50	21
	March 9	7	6	48	39	6
	April 8	5	28	29	34	8
	April 9	3	16	73	11	0
	May 15	1	19	25	48	8
	May 24	2	80	11	6	4
	June 18	10	24	34	38	5
	July 7	1	0	47	42	11
	July 26	3	43	37	13	8
	August 8	2	23	28	45	4
	August 22	4	21	48	26	6
	September 10	1	43	36	13	8
	September 24	6	52	31	12	6
	October 7	3	41	27	16	14

Recent Experiments On Melanose Control With Reference to Organic Fungicides and Dormant Sprays

R. F. Suit
Citrus Experiment Station
Lake Alfred, Florida

At Meeting Florida State Horticultural Society

During the past five years numerous new organic fungicides have been developed. Many of these have given excellent control of diseases on tomatoes, potatoes, apples, cherries, peaches, grapes and other crops. Voorhees (3) reported that Fermate and Spergon did not give satisfactory control of melanose while Miller (1) also reported that Fermate was unsatisfactory for melanose control. Since 1946, some of the organic fungicides have been included in the melanose control experiments each year.

The performance of the organic fungicides with regard to melanose control has not been as good as was expected from their effectiveness for the control of certain diseases of other crops. As is indicated in Table 1, all of the organic fungicides tested were inferior to the copper fungicides for melanose control on grapefruit. The final results of the 1948 experiment have not been recorded but sufficient data were obtained so that the performance of Zerlate could be included in this report.

There are two posible reasons why the organic fungicides were not as effective as had been expected. Organic materials, both insecticides and fungicides are often quite specific. A material will be very toxic to one organism and not to another. Further, since only one spray application was applied, the organic fungicides might not remain active over as long a period of time as do copper fungicides. Since a copper material functions as a nutritional as well as a fungicidal spray, it will be difficult for an organic material to be as effective in the over-all program of grove management.

Table 1.
A Comparison of the Effectiveness of Organic and Copper Fungicides for Melanose Control

Material*	Lbs. per 100 Gal.	Percent No. 1 Fruit 1946	1947	1948
Copofilm	2.2	89.3	—	—
C & H copper oxide	1.0	—	72.7	—
Copper compound A	1.7	82.8	71.7	—
Tribasic copper sulfate	1.5	86.2	—	—
Dodge-Phelps basic copper sulfate	1.5	88.4	—	—
Bordeaux mixture	3-3	83.1	60.5	96.2
Copper-8-quinolate	1.0	56.5	—	—
No. 341, 2-heptadecylglyoxalidine	2.5	63.5	9.8	—
Parzate	2.0	—	44.1	—
Zerlate	2.0	—	—	78.8
Manganese ethylene bisdithiocarbanate	2.0	—	21.3	—
Non-sprayed	—	7.8	10.6	12.2

* Sprays applied: April 1, 1946; April 28, 1947; April 2, 1948
Data recorded: December 23, 1946; December 29, 1947; October 7, 1948
Wettable sulfur 10-100 added to all sprays for rust mite control.

Although Ruehle and Kuntz (2) have shown that the dormant application of a copper fungicide did not give satisfactory control of melanose, it was thought advisable to obtain additional data on this point. If a reasonable control of melanose could be obtained by adding the copper fungicide to the dormant spray, the after-bloom application might be eliminated and thus reduce the cost of production during periods of low-price fruit.

Table 2.
A Comparison of the Effectiveness of Dormant and Post-bloom Fungicide Application for Melanose Control.

Year	Grove Pruned	Date of Application*	Percent No. 1 Fruit
1946	Yes	Feb. 18	50.3
1946	Yes	April 1	89.3
1946	Yes	None	7.8
1947—No. 1	No	Feb. 21	24.0
1947—No. 1	No	April 28	71.7
1947—No. 1	No	None	10.6
1947—No. 2	Yes	Feb. 22	34.6
1947—No. 2	Yes	May 1	74.8
1947—No. 2	Yes	None	45.4

* Spray applied composed of copofilm 2.2 lbs. and wettable sulfur 10 lbs. to 100 gallons.

Experiments were conducted in 1946 and 1947 and the data are presented in Table 2. The dormant application of a copper fungicide resulted in an unsatisfactory control of melanose on grapefruit. The crop of fruit from the trees receiving a dormant application of a copper fungicide showed excessive melanose and would definitely not be acceptable for the fresh fruit market and might not be usable at the canning plant. It is advisable to apply the fungicide according to the standard recommendations to obtain satisfactory melanose control; that is from one to three weeks after the fruit

(Continued on page 18)

The Influence of Rootstock On The Mineral Composition of Valencia Orange Leaves . . .

(An Abstract)

Paul F. Smith, Walter Ruether and Alston W. Specht United States Department of Agriculture Orlando

This paper is being published in full elsewhere(1) and only a summary of the results is presented here.

Young Valencia trees budded onto six different rootstocks were planted in a random-block experimental area near Tavares in 1942. The soil is Lakeland fine (formerly Norfolk fine) sand. The rootstocks used were sour orange (Citrus Aurantium), Rough lemon (C. Limon), Rusk citrange (Poncirus trifoliata x C. sinensis), Bowen grapefruit (C. paradisi), Cleopatra mandarin (C. reticulata) and Parson Brown (sweet) orange (C. sinensis). A complete mixed fertilizer (N, P, K, Mg, Mn, Zn, Cu, and B) was applied uniformly to all plots three times each year. Dolomitic limestone was applied uniformly to the entire experimental area at intervals in amounts sufficient to maintain the acidity of the soil at about pH 5.5. No nutritional sprays were applied at any time. The trees were two years old when the experiment started, and had been in the field five years when leaves were taken for analysis in late July, 1947. Determinations were made for dry leaf weight, ash content and the individual concentrations of eleven nutritive elements.

The mean dry weight of the leaves was influenced by the rootstock (see table 1), but there was no consistent relationship of leaf size to tree size. The most vigorous trees, produced by Rough lemon stock, had the largest leaves. These were 16.7% larger than the smallest leaves which were found on the grapefruit stock. Although the total number of leaves per plant was not determined, it seemed apparent that they would vary in the same manner as the size of the trunk.

The percentage of ash in the leaves from the grapefruit rootstock plots showed the greatest ash content which seemed to be a reflection of the high potassium content induced by that stock.

With the exception of sodium,

(Continued on page 11)

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FLORIDA CITRUS MUTUAL NEARING THE GOAL

As this is being written on the closing days of January, Florida Citrus Mutual, super-co-operative of Florida citrus growers, appears to be nearing the goal of seventy-five percent of the citrus tonnage of the state.

At a meeting of the temporary board of directors, named jointly by Senators Pepper and Holland and Governor Warren, a progress report showed that only slightly more than eight million more boxes were needed to reach the coveted goal.

Encouraged by this report, the leaders in the membership drive are now busily engaged in pushing the drive to a successful conclusion and are confident that by February 5 they will be able to announce that the requisite tonnage has been signed. Should their expectations be realized, notices will be mailed growers on February 7 calling for the election of a permanent board of directors. It is confidently predicted that within two weeks after such election Florida Citrus Mutual will be in actual operation.

It is to be regretted that there has been so much delay in the final organization of Mutual. This delay has cost the citrus growers of Florida millions of dollars through lack of organized marketing of their fruit. With Mutual actually operating, control of distribution of the Florida Valencia crop will be possible, and aided by the excellent quality of the Valencias now on the trees, the late season fruit should go far toward retrieving the loss sustained through hit-or-miss shipments of the early varieties.

With the goal "just around the corner," it is inconceivable that the hopes of the membership committee should not be realized. With only eight million boxes yet to be signed up, and with the disastrous effects of disorganized marketing so thoroughly demonstrated, there should be no further delay in putting the Mutual in operation. It is the one organization which seems to hold out hope for the growers of Florida citrus fruits. Let's put is over—quickly. If Florida growers have learned one lesson during the past three seasons it is that lack of cooperation among themselves is in large measure responsible for the losses they have sustained. Now is the time to get together—by joining up with Florida Citrus Mutual.

MUST WATCH EARLY SHIPMENTS

A well known Florida citrus grower and nurseryman tells us that after we have a state-wide cooperative marketing agency in operation to control distribution, we must act among ourselves to see that shipments of early fruit are acceptable to the consumer. We can't continue to offer the trade an inferior quality of early fruit and hope to escape the penalty when our really good fruit begins to reach the market. Either we must refuse to offer fruit until the mid-season varieties have reached maturity, or we must develop new varieties of early fruit which will meet the discriminating tests of the ultimate consumer.

That, says this well known grower, is a job for the growers themselves to take care of. Of course, the fruit going to market now is of exceptionally high quality—but it is still suffering from the effects of the tasteless, ricey fruit which flooded the markets early in the season. Florida can and does produce the best citrus fruits in the world and, he says, we have no excuse for producing and offering for sale any other kind. And it is more than possible that he has something there.

TWO GREAT CITRUS FAIRS

Again this winter, Florida is presenting two great citrus fairs—probably the greatest exhibitions of citrus fruits to be found anywhere in the world. These are the Florida State Fair at Tampa, which features exhibits of citrus fruits, and the Florida Citrus Exposition at Winter Haven, which, as its name implies, is a purely citrus show.

The Florida State Fair is now in progress with what is said to be the greatest display of citrus fruits ever shown at a state fair. Practically every citrus producing county in the state is represented with exhibits of the highest quality fruit streamlined to the highest degree of perfection.

The Florida Citrus Exposition at Winter Haven will open its twenty-fifth year as a purely citrus Exposition on February 14 for a full week of visual demonstration of Florida's foremost place in the world's citrus picture.

Both these great fairs are worthy of the support of the general public. No one who views these exhibits can longer doubt that Florida leads the procession in the production of citrus fruits of the highest quality and appearance. It will well be worth the while of every winter visitor and of every citizen of Florida to attend both of these exhibits of the state's leading horticultural product.

The California freeze which materially shortened the citrus shipments from that state caused millions of dollars loss to California growers. Uncontrolled shipments, flooding of markets by Florida shippers, deprived Florida growers of any benefits they might have received had shipments been controlled. An upsurge in prices in the first few days after the freeze were quickly dissipated by heavy shipments from this state.

With Florida citrus selling far below cost of production, it should not require any supermind to decide that cooperation among growers is the first essential to recovery of an ailing industry.

THE INFLUENCE OF ROOTSTOCK ON THE MINERAL COMPOSITION OF VALENCIA ORANGE LEAVTS

(Continued from page 9)

all of the chemical elements determined show significant differences in concentration due to rootstock. It is evident, therefore, that root systems from different genera of citrus exercise some selectivity in their nutrient uptake. This is based on the assumption that the leaf composition reflects the relative absorption of minerals by the roots. No single element shows a perfect relation between the concentration in the leaf and the size of the tree, yet the two rootstocks that produced the largest trees (Rough lemon and Rusk citrange) also tended to induce the greatest concentration of many of the individual elements in the leaves. This is more readily seen in table 2, where the rootstocks are ranked in accordance with the increase of each element as percentage of the leaf dry matter. The stock occurring in the upper position in each column contained the least amount of that particular element. The least vigorous trees, which were produced by sour orange and grapefruit stocks, tend to fall in the upper positions in the columns.

When the chemical constituents were expressed on an absolute basis (ie., mgm. per leaf) nitrogen alone showed a positive correlation with tree size. These values were 6.8, 6.8, 7.3, 7.4, 7.6, and 8.4 mgm. per leaf for sour orange, grapefruit, Cleopatra mandarin, sweet orange, Rusk citrange, and Rough lemon, respectively. None of the other elements showed a consistent trend in this respect. These differences in the absolute amounts of nitrogen would, in all probability, be magnified considerably if the total number of leaves per plant were to be taken into consideration. This suggests that, if the accumulation in the leaves of any one of the elements measured was a major factor in the different growth rates found, it was nitrogen.

Another point clearly shown by these data is that the micro-nutrient element concentrations were influenced to a greater extent by rootstock than were the macro-nutrient. Thus, nitrogen, phosphorus, and calcium showed only about a 10 to 15% increase from the stock with the lowest leaf content to that with the highest. Iron and zinc, however, showed over 100% difference between the extremes, and manganese and copper showed about 65% each.

Experience has shown that Rough lemon is better adapted to the light, sandy, ridge soils of Florida than other commonly used rootstocks. Young trees grow more

(Continued on page 18)

Lyons Staff Member Gives Rea
Of Lyons Fertilizer Company's F

J. H. Rickborn, Lyons Sales Manager, states th re allied with the Citrus Industry he was asked wh it such high regard by their customers. So he sets fth

The Lyons Fertilizer Company is an organization controlled entirely by Florida people, with W. L. Waring, Jr., as President and guiding head. Mr. Waring was one of the organizers of the Company and during the life of this organization which covers a period of 25 years, he has been interested in the entire agricultural set-up in Florida, and has devoted a great part of his time and effort to further the development of all phases of work which would result in a better and more prosperous agricultural program for the State. Mr. Waring is at all times available to advise not only with the employees of the Company but in many instances advises with customers of the Company who seek his expert counsel.

The General Manager of the Lyons Fertilizer Company is J. C. (Corky) Wolfe and his sentiments for many years have been that if we are to be of service to Florida we must be of assistance to the citrus and vegetable growers, the flower growers and the cattlemen of the State. He still is of this opinion and anxiously desires to serve all customers in the Lyons program of "Better Fertilizer for a Better and More Prosperous Agriculture."

W. F. (Dubbie) McLane is treasurer of the Company and Credit Manager. He is always going "overboard" to assist some grower in working out a program that will enable him to carry on with his agricultural program. Because of his genial and friendly nature he is highly regarded by all customers of the Lyons Fertilizer Company.

V. E. (Val) Bourland has been with the Lyons Fertilizer Company for 24 years and is one of the main reasons why our customers insist that Lyons Service is the best and that our fertilizers, when given a fair chance, are always voted outstanding. This man is loyal to Company and Customers and for that reason is a real asset to the company.

For 14 years C. S. (Charlie) Li has ing the Hillsborough and Pinel cour having succeeded his father wh work tory before him. The Little me in is synonymous with with ser e a vice. Charlie is held in high re d b and has done an excellent job pro quality and large quantities of uit.

The man who cove olk producing county the Sample. Jim has en w years and he is probly t highly regarded f ilize He services some one la and his production cord Jim is a sizeable g wer the "know-how" wh it c out of a grove at th wes

E. A. (Mac) McCartney has b an our Company for 10 years and the covers there is no one more hly considered more dependable an will go to bat with any membe f the utive staff to get the utmost c ider of his customers, and is intens loy company and his customers.

Norman Tuckett w cov ritory has been w the This man is certa hat best to be had a he grows have bee o o feel that Lyons F lize are a NECESSITY outs obtained.

Reasons For Splendid Reputation y's Field Force . . . . . .

s th recently in talking with a group of men in fields whyit was that the Lyons Field Force was held in ts fth here his impressions of the Lyons staff.

lie) Li has been work- l Pinell county territory, her wiworked the terri- .ittle me in this section th ser e and good ad- nigh rerd by all growers nt jobf producing high ties ofuit.

o cover olk County, the largest citrus ounty the world, is J. M. (Jim) m has en with the Company for 10 is probly the best known and most rded filizer man in the territory. ome ohe largest groves in the State uction cords have been phenomenal. able gwer in his own right and has ow" wh it comes to getting the most e at thwest possible cost.

has bn an employee of rs and the territory he more hly regarded or ndable an "Mac." He nember the Lyons exec- nost coideration for one intens loyal to both his ners.

kett w covers the Lake County ter- een wi the Company for 15 years. certathat Lyons Fertilizers are the ad anhe results he has given his e beeo outstanding that they too ons Fzers and Norman's service SSITY utstanding results are to be

Eaves Allison has been with us for five years and covers our most important vegetable and flower producing section. This area is the southwestern part of the state. Eaves has done a remarkable job in his section and many have been the reports that he is one of the hardest workers and best posted men in the territory. Gladiola growers as well as vegetable growers are constantly demanding his services.

The baby of the Field Force is R. L. (Bob) Padgett of Avon Park, who covers South Polk, Highlands and Hardee counties. Bob is considered one of the "Firsts" in his territory. As a Marine Flyer during World War Two he was the first pilot to attack Raboui in the Pacific. His reputation is growing rapidly. He has been with us three years.

Another important man in our organization is our Plant Superintendent, Eddie Bourland, who is constantly alert to every operation in the plant to see that the minute details are carried out to assure all customers the best in quality and physical condition. He stays awake at night to see that your orders are delivered on time and is one of the best friends any customer ever had.

J. C. WOLFE, GEN. MGR., ADDS A COMMENT CONCERNING LYONS SALES MANAGER

Another one of the reasons why Lyons Fertilizer Company has always been outstanding is because of the inestimable qualities of its genial sales manager, J. H. "Rick" Rickborn. "Rick" is a graduate Agronomist from Clemson College and has devoted a life time to the study of Florida soils and Florida agricultural conditions. He is regarded as one of the best informed men on Florida soils and is always ready and willing to offer his assistance to the Lyons representatives and their customers. "Rick" makes his headquarters at Lakeland and devotes his time to being of service to the agricultural industry of Florida. The Lyons Fertilizer Company feels proud to have such a well qualified man available to render service to its customers.

Summary of Research Investigations Being Conducted In The Citrus By-Products Field . . .

Fred P. Lawrence
Citriculturist, Florida Extension Service, At Citrus Institute

As an introduction to my talk on "Summary of Research Investigations being Conducted in the Citrus By-products Field", I would like to read to you a paragraph taken from the scientific publication, "Economic Botany", as written by Glenn H. Joseph of the California Fruit Growers Exchange. I read "The citrus—products industry—a costly infant in the early 20's—has grown during the past quarter century to one of the world's outstanding examples of successful commercial utilization of an agricultural surplus. Wisdom in planning with confidence, foresight and patience in research and development, converted a botanical wastage to a national industry doing an annual business of more than $125,000,000. Students of economic botany may well pause to review this example of chemurgy as an illustration of the possibilities in their respective phases of this field.

One of the factors which stimulated products development in the citrus industry was the tremendous increase in fresh fruit production during the past two decades. The total citrus production in the United States, in terms of standard packed boxes of fruit was:

56,000,000 boxes in 1926
93,000,000 boxes in 1936
196,000,000 boxes in 1946

This figure for the 1946 production may be visualized more easily by realizing the 196,000,000 boxes of fruit, stacked end on end, would extend upward 81,000 miles, one-third the distance to the moon!

Although continued and extensive advertising campaigns have steadily increased the consumption of the fresh fruit, it has been necessary to utilize an increasing volume of fruit for products in order to give the industry a semblance of stability."

Utilization of citrus juices for food purposes has not been a recent development. History reveals that more than 40 centuries ago "Oranges and Pummelos" were presented as delicate gifts to a Chinese emperor. Records show that citrus fruits were known to the Pharaohs of Egypt in the 15th Century B. C. During the centuries since that time many historical entries show the growing realization that the juices of citrus fruits possess healthful and even medicinal properties. The present generation, however, has been the first to attempt the preservation of citrus juices on a commercial scale, and it is my sincere belief we have only started.

Canned juices account for the largest volume of processed oranges and grapefruits and even now **tangerines** have begun to leave their kid-glove status and become a popular juice product. **Quality** has been improved so that it is now possible to retain all vitamin "C" by proper canning methods and techniques and at the same time produce a product that appeals to ones taste. The canning industry has progressed to a point where about **50 million** boxes of oranges, grapefruit and tangerines were used by canners, representing **52, 67** and **17** per cent, respective-

(Continued on page 16)

SUMMARY OF RESEARCH INVESTIGATIONS BEING CONDUCTED IN THE CITRUS BY-PRODUCTS FIELD.

(Continued from page 14)

ly, of total production this year (47-48).

CONCENTRATED JUICES

These account for a considerable volume of fruit and have been improved in flavor and food value to a point that they are almost indistinguishable from the fresh fruit.

Outstanding demonstrations have been made of the superior flavor of this product, for example, last Winter blindfold tests were conducted at the Webber College Business Conference. This was during a time that our orange season was at its peak and fresh fruit quality should have been at its best, yet when the taste tests were completed it was found that the reconstituted frozen concentrate was chosen by 80 to 32 as being the best juice while 9 couldn't make up their mind. During the War years the government took practically all of our total output of this product and therefore the public has not long had access to it but the satisfactory prices being paid for it indicates citrus products can be marketed profitably when buyers have confidence in the quality.

POWDERED JUICE

This can be made but the cost of making powders containing little or no filler is high. The produce is bulky and hygroscopic and the market is correspondingly limited. It can best be used for polar expeditions and desert conditions because of this hygroscopic condition.

DISITILLED OILS

As yet we have not perfected a method of extracting the juice from citrus fruits without getting some of the peel oil along with it and since too much of this oil is objectionable in the juice it must be taken out. Distilled oil is used primarily as a base for perfumes and the manufacture of soaps.

BEVERAGE BASES

Citrus growers often wonder why orange and grapefruit juice in small bottles within easy reach at the many thousands of soft drink counters throughout the country should not find a highly important outlet among the consumers of countless millions of bottles of "pop" every year. The juice is widely recognized as being much better for the human system and at least as appealing to the taste, but the numerous attempts already made to win over the general public in its daily thirst-quenching have not met with any great success. Great progress has been made in this field and no doubt we will soon have a bottled drink that will rival even Coco Cola.

WET PULP

There are two main sub-heads under this block. I will take the one leading to press juices and discuss it first. (Cow feed as is).

PRESS JUICE

Even when the pressing operation is not used in the preparation of citrus waste for drying, there is a drainage liquor produced that amounts to perhaps 10% of the weight of the treated waste. When pressing is practiced the liquor removed may amount to as much as 50% or more of the weight of the raw material. This liquor contains between eight and 13% soluble solids, mostly carbohydrates.

CITRUS MOLASSES

These carbohydrates are being utilized for animal feeding by concentrating the liquor to molasses containing approximately 10% solids.

If we choose to do so the citrus molasses can be further processed to yield other products; namely: butyl alcohol, feed yeast and a bland syrup.

ALCOHOL

It is believed that only under the conditions which existed during the war, when governments directives prohibited the use of grains and cane and beet sugar products for the manufacture of beverage alcohol, would citrus molasses have a place in the alcohol production industry. It is interesting to note that there is a plant here in Florida which has a capacity of 2000 gallons of 190 proof alcohol per day. (The plant is located at Lake Alfred).

FEED YEAST

This is another product produced from citrus molasses and since it falls into the feed group, I will pass it over because it will be dealt with by Dr. Miller in his

talk on citrus feeds for livestock. (USDA has pilot plant at P. Phillips Cannery in Orlando).

CITRUS SYRUPS

Another product has been developed in the laboratory (from citrus molasses) which may eventually attain commercial significance. A bland syrup may be prepared from either juice or waste liquors. This may compete with a bland syrup that is now being used as a substitute for glycerine in tobacco for the manufacture of cigarettes, or it may also be used as a table syrup. Incidentally this syrup does not crystallize, therefore, it should be highly satisfactory for a table syrup as well as for use in a pharmaceutical mixture or base.

CITRIC ACID

Citrus acid and citrates are being derived from the juices of all varieties of citrus fruit. Although it is true that citric acid is the main acid material in the juices of fruits from all varieties of citrus, the amounts present in varieties other than the lemon and lime are too small to justify extraction with the present commercial methods. The juice of the lemon contains from 5 to 7% citric acid, about 5 times as much as is found in orange juice.

About 20 million pounds of the white crystalline acid and its various salts are produced in this country for use in the food and pharmaceutical industries. Of this 20 million about one million comes from citrus. It may be that new methods will increase this volume.

ASCOBBIC ACID

This is the vitamin "C" content that we advertise so universally. And we rightly should. Studies on scurvy more than a century ago demonstrated that citrus juice corrected all symptoms associated with the disease, including the capillary hemorrages. Investigations during later years indicated that the Vitamin "C" content of citrus is the curative factor. When synthetic Vitamin "C" became available, however, it was found to be ineffective in alleviating all the scorbuctic symptoms related to capillary weakness. This led to the discovery of Vitamin "P" which I will not discuss as Dr. Redd is to present a paper on this subject and I don't want him to have to use all of his allotted time trying to correct the wrong impressions I might create if I were to attempt

(Continued on page 19)

THE INFLUENCE OF ROOTSTOCK ON THE MINERAL COMPOSITION OF VALENCIA ORANGE LEAVES

(Continued from page 11)

rapidly and bear more heavily for a number of years when budded onto this stock. The present findings seem to suggest that the ability of Rough lemon roots to provide the tops of the trees with larger quantities of nutrients (especially nitrogen) than sour orange roots may account, at least in part, for the above observations. The larger leaf size resulting from the use of this stock may reflect a greater moisture procuring capacity in light soil by the Rough lemon roots.

Summary

Valencia orange leaves, from a randomized plot experiment involving six different rootstocks, were analyzed for total ash content and eleven chemical elements.

The results show that the rootstock is of considerable importance in determining the pattern of mineral composition of scion leaves. Highly significant differences in the percentages of nitrogen, potassium, calcium, magnesium, manganese, copper, boron, zinc, and iron attributable to rootstock influence were found. The sodium content of the leaves was not significantly affected by rootstock.

Rootstocks induced larger variations in the concentrations of the micro-nutrient elements found in the leaves than they did in the case of the macro-nutrient elements.

The absolute amount of total nitrogen per leaf appeared to be correlated with tree size. None of the other elements determined showed such a consistent trend. This suggests that there is a differential ability of the stock to supply nitrogen to the scions and this in turn contributes toward producing the different growth rates observed.

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1. Smith, P. P., Reuther, W., and Specht, A. W. The influence of rootstock on the mineral composition of Valencia orange leaves. Manuscript submitted to Plant Physiology.

Table 1. Summary of trunk circumference, leaf weight, ash, and chemical element content of foilage of 5-year old Valencia orange trees on six different rootstocks

Rootstock	Trunk circ. (mm.)	Leaf wt. (mgms.)	Percent in dry leaves						p.p.m. in dry leaves					
			Ash	N	P	K	Ca	Mg	Mn	Cu	Fe	B	Zn	Na
S.O.	165	267	10.49	2.55	0.136	2.11	2.26	0.488	69.0	4.97	74.7	67.3	16.7	485
G.F.	210	264	11.23	2.56	0.141	2.62	2.11	0.369	62.3	5.62	59.3	93.6	21.7	514
Cleo.	212	292	10.60	2.50	0.140	1.97	2.33	0.482	87.7	5.30	87.3	81.1	33.7	489
Sw.	239	282	10.58	2.63	0.150	2.30	2.16	0.408	53.3	7.28	81.7	84.1	18.7	515
Rusk	245	272	10.44	2.81	0.145	1.76	2.41	0.514	80.2	8.34	125.9	94.6	19.7	527
R.L.	288	308	10.89	2.74	0.141	1.98	2.44	0.510	85.0	5.32	101.6	79.7	20.3	497
Maximum diff. (Percent)	74.5	16.7	7.6	12.4	10.3	30.7	15.6	39.3	64.5	67.8	111.9	40.6	101.8	8.7
Sig. of treat.	**	**	**	**	**	**	**	**	**	**	**	**	**	—
L.D. @ 5%	27	20	.38	0.13	0.010	0.22	0.20	0.049	14.7	2.24	13.3	13.1	4.8	—
L.D. @ 1%	36	26	.51	0.17	—	0.30	0.26	0.066	19.6	2.99	17.8	17.5	6.8	—

S.O.—Sour orange; G.F.—grapefruit; Cleo.—Cleopatra mandarin; Sw.—sweet orange (Parson Brown); Rusk—Rusk citrange; R.L.—Rough lemon.
* Signifies that the odds for significance exceed 19:1, but less than 99:1.
** Signifies that the odds for significance exceed 99:1.
L.D. Signifies the least difference for significance between any two means.

Table 2. Relative ranking of rootstocks in relation to the mineral content of Valencia orange leaves when expressed as percentage of dry matter.

Rank*	Trunk circ.	Leaf wt.	Ash	N	P	K	Ca	Mg	Mn	Cu	Fe	B	Zn
1	S.O.	G.F.	Rusk	Cleo	S.O.	Rusk	G.F.	G.F.	Sw.	S.O.	G.F.	S.O.	S.O.
2	G.F.	S.O.	S.O.	S.O.	Cleo.	Cleo.	Sw.	Sw.	G.F.	Cleo.	S.O.	R.L.	Sw.
3	Cleo	Rusk	Sw.	C.F.	G.F.	H.L.	S.O.	Cleo.	S.O.	R.L.	Sw.	Cleo.	Rusk
4	Sw.	Sw.	Cleo	Sw.	R.L.	S.O.	Cleo	S.O.	Rusk	G.F.	Cleo.	Sw.	R.L.
5	Rusk	Cleo.	R.L.	R.L.	Rusk	Sw.	Rusk	R.L.	R.L.	Sw.	R.L.	G.F.	G.F.
6	R.L.	R.L.	G.F.	Rusk	Sw.	G.F.	R.L.	Rusk	Cleo	Rusk	Rusk	Rusk	Cleo.

S.O.—Sour orange; G.F.—grapefruit; Cleo.—Cleopatra mandarin; Sw.—sweet orange(Parson Brown); Rusk—Rusk citrange; R.L.—Rough lemon.

*The rootstock in the uppermost position in each column represents the scionrootstock combination with the smallest measurement for that particular factor, the other stocks being arranged in order of increasing magnitude down the column. Stocks above the underlined one do not differ significantly from each other, while all below differ significantly from the uppermost stock.

RECENT EXPERIMENTS ON MELANOSE CONTROL WITH REFERENCE TO ORGANIC FUNGICIDES AND DORMANT SPRAYS

(Continued from page 8)

has set.

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SUMMARY OF RESEARCH INVESTIGATIONS BEING CONDUCTED IN THE CITRUS BY-PRODUCTS FIELD.

(Continued from page 17)

a discussion.

But before leaving this topic let me make a comment that might be of interest to a few of our former GI's present. By 1860, scurvy was practically banished in the British navy because of the acquired knowledge of the value of lemons in combatting the disease. In those times lemons were frequently miscalled limes. In 1867 laws were passed compelling the merchant marine to carry a supply of lime or lemon juice as a protection against scurvy and even to this day British sailing vessels are often spoken of as "Lime Juices" and their crews as "Limes".

PRESS CAKE

Now let's take up the pressed cake and look at some of the things that come from it. First of all it can be used as a livestock feed without further processing and since Dr. Kirk will discuss this with you we will pass on to the dry pulp, but there again we find a paper is to be presented on this so we will tackle the next product Pectin. But before we get too involved in this subject maybe I had better say something about the essential oils.

PECTIN

Pectic substances have been an item of human diet since Adam and Eve began eating apples. Actual scientific publications describing the pectic substances did not appear, however, until the beginning of the 19th century. Pharmaceutical and medical applications of pectin were first mentioned in literature in 1825. Since that time scientific literature on the subject has grown to voluminous dimensions and the substances themselves have found many commercial uses, not only in foods and medicine, but in industries as diverse as steel, rubber, paper and oil.

Although pectin is widely distributed throughout the plant kingdom, there are only a few sources at present capable of commercial utilization. These are in citrus peel and apple pomace.

The most important pectins in the food field are the two types known as rapid and slow set varieties. The makers of berry jams

(Continued on page 20)

A PRELIMINARY REPORT ON THE POSSIBILITIES FOR FORECASTING PERIODS OF OVIPOSITION ACTIVITY FOR PURPLE AND FLORIDA RED SCALES.*

(Continued from page 7)

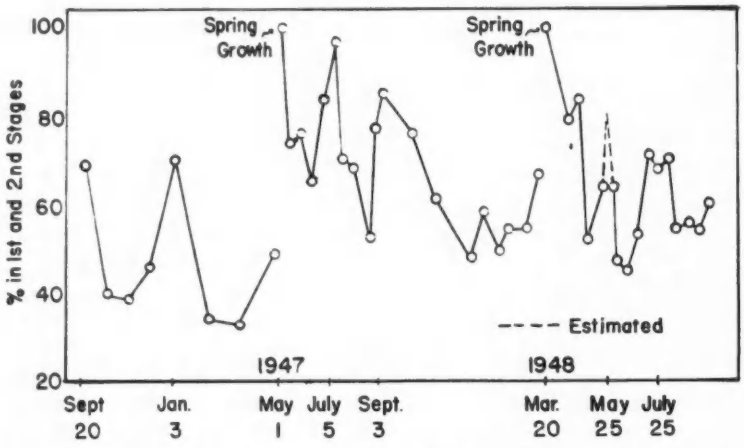
For both species, the time between oviposition periods was shortest during the summer months. more useful.

Summary

Actual populations changes for both purple scales and Florida red scales are shown by means of graphs for the period September 1946 to October 1948. The changes in the per cent of scales in a given stage appeared to be similar throughout the citrus producing areas of Florida. Florida red

Figure 2

Changes in the Per Cent of Purple Scales in First and Second Stages During a Two Year Period.



It may be calculated at about eight weeks for purple and six weeks for red scales. Cooler weather in the fall or winter materially lengthened the period between oviposition periods.

Before completely accurate forecasts can be made for any given citrus area, further study of weather relationships is essential, as well as a closer examination of the exact manner in which the per cent of a given stage changes from day to day. In addition, the possibility that population changes may be slightly different in the widely separated citrus areas of Florida must be considered. However, the basic information already available should make it possible to forecast with some degree of certainty the approximate times when scale populations will be largely composed of young insects. This information should help the individual grower or the production manager to better time oil sprays in heavily infested groves. The forecasts will, of necessity, be limited in scope, but it is hoped that additional experience will render them ever

scales averaged at least one generation more per year than did purple scale. Both species had initial periods of oviposition which coincided approximately with bloom time in the springs of both 1947 and 1948. Oviposition periods follow one another in regular sequence, and it is concluded that forecasting of periods when the bulk of the scales are in first and second stages should be practical for the 1949 season.

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2. Thompson, W. L. 1937. Supplements in dormant bordeaux sprays for insect control on citrus. Cit. Ind. **18** (1): 8-9.

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SUMMARY OF RESEARCH INVESTIGATIONS BEING CONDUCTED IN THE CITRUS BY-PRODUCTS FIELD.

(Continued from page 19)

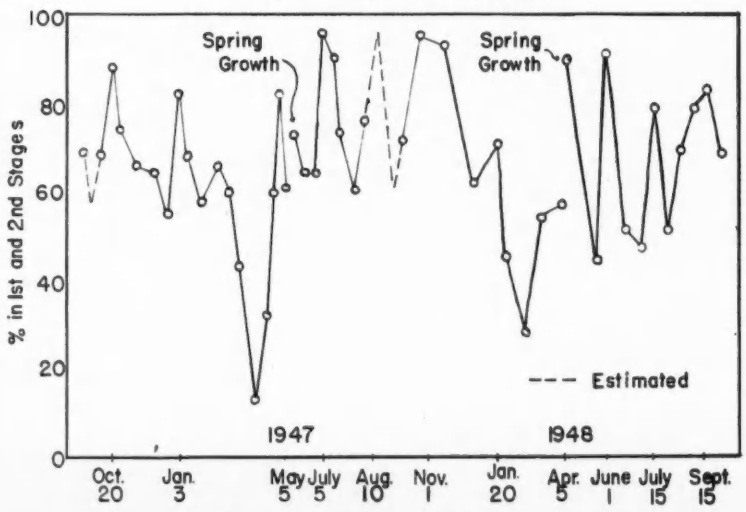
prefer to have their product "set" soon after filling the containers, whereas commercial jelly makers prefer to "slow set". Confectioners pectin became an article of commerce about 15 years ago and with it came a "gum drop" of new and superior qualities.

The use of pectin in medicine for the treatment of colitis, diarrhea, and dysentaries developed in

(Continued on page 21)

Figure 3

Changes in the Per Cent of Florida Red Scales in First and Second Stages During a Two Year Period.



SUMMARY OF RESEARCH INVESTIGATIONS BEING CONDUCTED IN THE CITRUS BY-PRODUCTS FIELD.

(Continued from page 20)

Europe during the years following 1928 when the Heisler-Moro diet became popular.

During the recent war much success attended clinical uses of properly prepared pectin for the transfusion treatment of shock using the pectin solutions as substitutes for human plasma.

The pectates which are of most interest from the viewpoint of the large scale utilization of surplus citrus fruit are the "Pectate Pulp" and "Pectate Acid Pulp".

By far the most important product derived from this former waste materials is cattle feed. Solid canning plant waste consisting of peel, pulp and rag is ground in hammer mills, treated with lime or other coagulants, pressed to remove excess liquids, and then dried in steam or direct-fired kilns. I will not say more on this because those items fall into the citrus feed groups and will be discussed for you by Dr. Miller.

VITAMIN "P" GROUP

Vitamin "P" is a remarkable substance which is essential to the proper functioning of the small blood vessels. For the past 10 years, it has been recognized as valuable in the treatment of high blood-pressure, one of the nation's foremost killers, but until very recently its use has been limited almost to the test tube stage because of the difficulty and expense in isolating it. Now I understand Dr. Boris Sokoloff, head of the research department of Florida Southern College's new citrus school has developed a method of producing it from citrus at a low cost. (They now have a pilot plant ready for operation).

Having now pretty thoroughly covered the subheads under Juice and Pulp so we will take up the study of the seed. From citrus seeds we obtain three products: citrus seed cake, citrus seed oil and finally the seed hulls. The oils are known as "Fixed Oils".

NARINGIN

Along with the group Vitamin "P" we have Naringin which is a flavanone glycoside extract from grapefruit peel. It is that bitter part you taste in the "rag" of the grapefruit and is used commercially for its extremely bitter taste. In Europe it is used as an ingredient in some beverages and also in the making of marmalades. In this country it is used to some extent in medicines.

ESSENTIAL OILS

The outer layer of the rind of citrus fruits contains the essential oils which are so widely used in the food industries as flavors. Two types of oil are listed mainly because of the methods of extraction. They are cold pressed and distilled. The cold pressed type is the more important and is the only one admitted by the U. S. Pharmacopacia.

The distilled oils are obtained by steam distillation of the pressed fruit. These oils are quite different in character from those made by cold pressing, and although the distilled oils may be used as flavors in certain food products, perhaps their greatest application is in the field of perfumes, and in soap manufacture.

METHANE FERMENTATION

The fermentation of waste waters to produce methane gas has been investigated during the past 2 years. This is a valuable by-product since it can be burned for fuel by the canning plant. In laboratory experiments more than 80% of the organic solids are digested. At the same time the oxygen consumed value of the waste water was reduced about 95%. These results have been so promising that a pilot plant is now in operation. (At Florenceville).

CITRUS SEED OIL

The citrus seeds are rich in oil that is somewhat similar in nature to cottonseed oil. It has been used in making detergents, and presents excellent opportunities for the manufacture of edible fats and oils. It is estimated that on the average the seeds represent about 3% of the weight of the whole fruit and that the amount of the seeds in the fruit processed in 1946-47 was about 48,000 tons, a potential source of about 10 million pounds of oil.

PRESSED SEED CAKE

The pressed cake can be used as a protein feed especially valuable for livestock or it can be recombined with the dried citrus pulp to raise its protein content.

HULLS

Citrus seed hulls can be used in the citrus pulp feeds or as a filler in high analysis fertilizers. The latter use is the more preferable.

CANDY-MARMALADE-JAM-JELLIES AND WINE

Are all citrus products that help to reduce our surplus but appear to be pretty well limited so far as a big scale reduction is concerned.

CONCLUSION

While the majority of the peel and pulp is utilized at present, the prospects of new products from these materials are intriguing. The crop is grown in limited geographic areas and raw materials are concentrated in quantities sufficient for large-scale operation. A few statistics on the quantities of by-products available will indicate some of the potentialities. During 1946-47 season approximately 1,600,000 tons of citrus was used in the manufacture of products in Florida. Of this total about 57% or 910,000 tons was peel, pulp and seeds. From this 96,900 tons of dried pulp and 55,800 tons of citrus molasses were made.

This listing and brief description of citrus products has been presented to bring out the extent to which science has contributed to the economic welfare of the citrus industry and at the same time to create in your minds the thought that, if properly handled, citrus products might well be the avenue leading us from this state of economic chaos to a future of reasonable prosperity.

During 1948 each farm worker produced food for himself and thirteen others.

Exports of U.S. Citrus Fruits to be Encouraged

The production and Marketing Administration of the U. S. Department of Agriculture recently announced a program designed to encourage exports from the United States of fresh and processed citrus fruits (except limes) to European countries eligible to receive aid under the Foreign Assistance Act of 1948.

The program provides for payments of one-fourth of the gross sales price (computed before deduction of such payment) basis f. a. a U. S. port. Such gross sales price shall not exceed the domestic market price of the product at the time of sale and place of delivery as determined by the Administrator, Production and Marketing Administration.

Department officials said this program is intended to encourage exports over and above the quantities which otherwise would be exported, and therefore provisions of the program will not apply to quantities exported to the United Kingdom until after one million gallons of concentrated citrus juice or its equivalent shall have been exported to the United Kingdom during the period July 1, 1948-June 30, 1949.

Announcements containing full details of this program will be mailed soon to all known shippers and processors of citrus fruits. Exporters may obtain additional information and copies of the announcement by writing to the following representatives designated for citrus fruits originating in the area named:

Texas — J. Wayne Reitz, Fruit and Vegetable Branch, P&MA, Department of Agriculture, Washington 25, D. C.

Florida — M. F. Miller, Fruit and Vegetable Branch, P&MA, Department of Agriculture, P. O. Box 19, Lakeland, Fla.

California-Arizona — M. T. Coogan, Fruit and Vegetable Branch, P&MA, Department of Agriculture, 1206 Santee St., Los Angeles, Cal.

Valuable Patent Assigned To Public

A public service patent covering the basic process widely used in manufacturing frozen concentrated citrus juices has been granted to three members of the Florida Citrus Commission's research department, including the research director, Dr. L. G. MacDowell, of Lakeland, it was announced recently by Marvin H. Walker, general manager of the Commission.

The patent, based on research conducted in 1944 and 1945 by Dr. MacDowell, and Dr. Edwin L. Moore and Dr. Cedric D. Atkins of Winter Haven, is assigned to the United States government as represented by the Secretary of Agriculture. The experimental work was conducted cooperatively with the U. S. Department of Agriculture at its Citrus Products Laboratory in Winter Haven.

All major manufacurers of frozen concentrated orange juice use the Commission process, involving evaporation at low temperatures under vacuum with an add-back of fresh juice, Walker pointed out. Production of frozen concentrated juices on a commercial scale was begun three years ago and this is now the fastest growing phase of the citrus industry.

"Dr. MacDowell and his associates in the Florida Citrus Commission research department, in assigning the invention to the United States, have dedicated the process they developed to the free use of the citrus industry," Walker said, "and any limitation on the use of the patent would be in the hands of the Secretary of Agriculture."

The application for the patent, filed in August 1945, sets out that "this invention relates to a process for preparing fruit juice concentrates of superior flavor and is particularly directed to citrus juice concentrates." The process has been successfully used with orange juice, tangerine juice and grapefruit juice, and also can be applied to other fruit juices, Dr. MacDowell said.

Florida's 25th Citrus Exposition

(Continued From Page 3)

a bevy of the state's most lovely young ladies on Monday night, and Her Highness and Court will be crowned at impressive coronation ceremonies on Tuesday night at the amphiteatre.

"After twenty-five years of service to citrus and Florida, we feel entitled to go all out to make our Silver Anniversary the greatest show we have ever had," declares President Snively. "We are still planning events to publicize citrus and the state to the nation and to provide entertainment for for thousands who will attend the show here."

Safety tips: Disconnect electric appliances as soon as you finish using them.

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